Seattle Department of Transportation
sdot
CAM
Client Assistance Memo
2212
Seattle Permits
— part of a multi-departmental City of Seattle series on getting a permit

Base Map and Survey Requirements for Street Improvement Plans (SIP)

Effective Date 4/5/2010

Accurate surveys and base maps are required to protect City infrastructure, private property, easements, rights-of-way, and are essential for planning, designing and constructing improvements in the right-of-way.

The survey provides control and basic topographic information about all manmade or natural features. **Control** is required so that right-of-way limits, property lines and other legal lines are properly established for the purposes of constructing ROW improvements. A **topographic survey** shows all topographic elements that can be identified using standard survey methods.

In order to ensure that infrastructure can be built as shown on the street improvement plans and that damage to existing infrastructure won't occur, the City of Seattle requires that both a **complete survey and a complete base map** be submitted with any SIP plan that has been developed to 30% or greater. The survey and base maps must be submitted as separate sheets and do not need to be included in as separate sheets in the plan set. However, the base map must also be screened back on the SIP plan set. All surveys and base maps submitted for SIPs are required to meet the standards identified in this Client Assistance Memo (CAM). For the purpose of this CAM the survey and base map are defined as follows:

Survey: This is a map prepared by a professional land surveyor licensed in the State of Washington. In general this map will show property boundary lines and all existing physical features. This map must contain the information outlined below and all the information required in the Survey Checklist.

Base Map: A base map is the existing below and above ground surveyed information within the project right-of-way. This information is shown as part of the Street Improvement Plan (SIP) prepared by a professional civil engineer licensed in the State of Washington. The civil engineer preparing the SIP will use the portion of the survey where new improvements are being designed to build a base map. The base map must be prepared as outlined below and, in addition to the requirements of the survey checklist, must contain all the information required in the base map checklist.

SURVEY REQUIREMENTS

1. *Limits of Survey*

The topographic survey information must be shown for the full width of the rights of way adjacent to the project site, for at least 10' beyond the rights of way onto the private parcel(s) being improved, and for at least 50 linear feet along the ROW beyond all of the boundaries of the project site and/or proposed work.

The entire intersection including all four corners up to the far point of tangency of each curb return or roadway edge must be included in the survey for projects located adjacent to an intersection.

If the rights of way adjacent to the project site are not improved with curb and sidewalk the survey limits may, at the request of the SIP Project Manager, need to be extended to include the entire block. If improvements will be made to an unopened or unimproved alley the survey boundaries must extend to the intersecting street(s).

2. *Accuracy*

Drawings shall have accuracy to within the following limits: control line and R/W line distance shall at no point have a horizontal or vertical error in excess of 0.02 feet. All surface features shall be located horizontally to within 0.2 feet. Underground features located using utility sensing devices shall be within +/- 1.5 feet horizontally. Utility record location shall be within 2.0 feet of scaled position of record drawings.

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3. ***Standard Abbreviations, Shading, and Symbols***

   Features on the survey shall be shown and noted in accordance with standard abbreviations, shading and symbols found in the Standard Plans for Municipal Construction Standard Plans No 002 and 003 available at www.seattle.gov/util/Engineering/Standard_Plans_&_Specs/index.asp.

   If there is no standard abbreviation, shading and/or symbol for specific elements on the survey, then the abbreviation, shading and/or symbol used must be shown in a legend on the survey. Symbols should be scaled to match existing conditions.

4. ***Washington State Licensed Land Surveyor's stamp***

   All surveys require a Washington State Licensed Land Surveyor's stamp, signature with date, and contact information.

5. ***Readability***

   All information provided on the survey must be readable.

6. ***Sheet Size***

   The sheet size must be 22" x 34"

7. ***North Arrow***

   Compass Orientation: the north arrow shall be oriented with plan north to the left or top of the sheet. Range of 270-360°.

8. ***Graphical Scale***

   The minimum scale allowed for surveys is 1" = 40'.

9. ***Bar Scale***

   All survey documents must include a bar scale.

10. ***Lettering***

    All lettering for surveys shall be 0.08".

11. ***Street Names***

    Street names for all frontages are required to be shown on all surveys.

12. ***Control Requirements***

    Control

    Control refers to lines - often called centerlines, monument lines, and/or survey lines. These lines are not topographic features; they are legally defined by survey control markers such as monuments, brass plugs, tacks, and other types of markers. Control lines are connected from survey marker to survey marker. Survey markers can be found on almost every street and intersection within the public ROW.

    The primary purpose of the public right of way (ROW) is to allow for the movement of people, goods, and services. Public ROW is property within which the City of Seattle and Utility Agencies own and maintain infrastructure. Like control lines, ROW lines are not topographical features; they are legally defined and recorded at a specified offset distance from the control lines.

    The survey should establish all of the required control elements, and they must be shown on both the survey and base map.

    Vertical Datum

    The Vertical datum for all survey work for Street Improvement Permitting (SIP) plans shall be the North American Vertical Datum of 1988 (NAVD 1988). All elevation information shall be in U.S. Survey Foot Units. At least two vertical benchmarks must be shown and included in the surveyor's notes. One must be a published benchmark; the rest may be site benchmarks. The benchmarks used to establish ties to the datum must be shown in the surveyor's notes in the following format:

    VERTICAL DATUM BENCHMARK
    SOURCE:_____
    ID#: _____
    DESCRIPTION: _____
    LOCATION: _____
    ELEVATION: _____

    Horizontal Datum

    All Street Improvement Permitting (SIP) plans shall be in the Washington State Lambert Grid Coordinate System using the NAD83(1991) datum as established in accordance with chapter 58.20 of the Revised Code of Washington. There must be at least two monuments shown for each street frontage. The horizontal control to establish ties to the datum must be shown on the plans and/or be included in the surveyor's notes in the following format:

    HORIZONTAL DATUM
    OWNER: _____
    ID# (If Available):_____
    DESCRIPTION: _____
    LOCATION: _____
    NORTHING: _____
    EASTING: _____

Monuments

At least two monuments shall be shown for each street frontage in plan view. The plans must show and describe all monuments, geometry and references used to establish the right of way, lines referencing the right of way, property lines, easements and any rights in real property shown. Both the Survey and Base Map must show bearing and distance on property lines and monument lines, or radius, delta angle, and curve length on curving lines. If construction baselines other than the monument line are used, show the relation of each baseline to the monument line.

Coordinates (northing, easting) and descriptions for all monuments shown including bearing and distance between monuments for each street frontage are required. Dimensions from monument lines to right of way lines are required. A list of source references used to determine the right of way lines should be included with the survey. If the right of way is of variable width, show the width at each end of the block and project site boundaries.

If no monuments exist, then other documentation and reference materials, such as King County Record of Surveys, Superior Court Decisions, City Ordinances, or recorded deeds used to establish the right of way must be provided.

13. Topographical Features

Topographical features are derived from survey data. Topographical features can be natural or man-made and can include, but are not limited to, contours, water features, utility castings, pavement surfaces, fences, trees, landscaping, creeks, power poles, signal equipment, and drainage features.

Natural Features

Above ground features known as topographical features are derived from topographic survey data. Natural topographical features can include, but are not limited to water features, trees, landscaping, creeks, drainage features.

Trees

Show all existing trees within the right of way and all trees 6" or more in diameter on private property where the drip line abuts or overhangs the right of way. The trunk diameter at 4 ½ feet above grade and drip line shall be shown to scale on the topographic survey.

Water Features

Show lakes, rivers, streams, ditches, ponds and other surface water features. Show the line of ordinary high water and the top of any well-defined banks. Show the 100-year floodplain, as shown on FEMA maps. Show protected areas including top of bank of Type A, B, and C streams, centerline of Type D streams, and wetlands.

Man-made Features

All existing underground and surface improvements that can be interpreted from standard survey methods and records research must be shown on the topographic survey. All visible infrastructure including utilities, structures and appurtenances must be shown on the topographic survey. This includes but is not limited to: edges of pavements, concrete surfaces, asphalt surfaces, gravel surfaces, channelization, curbs, curb cuts, curb ramps, gutter and flow lines, sidewalks, landscape areas, pedestrian and bike paths, structures, rockeries, retaining walls, fences, bridges, swales, culverts, utilities, vaults and covers.

14. Contours

Show existing contours at 1-foot intervals for portions of the site with less than 5% slope, at 2-foot intervals for portions of the site with slopes greater than 5% and less than 40%, and for those areas exceeding 40% that will be graded. Show 5-foot intervals for portions of the site with slopes that exceed 40% but will not be disturbed.

15. Building Outlines

Show building outlines for buildings located on parcel(s) being improved that are located within 10 feet of the right of way. Provide spot elevations at all vehicle and pedestrian access points.

BASE MAP REQUIREMENTS

The base map for the SIP plan is created from the appropriate portion of the survey where new right-of-way improvements are to be shown. The base map, therefore, needs to meet all the same requirements as the survey listed above. There are a few differences however which are listed below:

1. Limits of Base Map

The limits of the base map may be less than the limits of the topographic survey. Base map information must be shown for the entire right of way, 10 feet into the property being improved, and 50 feet beyond the project limits.

2. Sheet Size

The sheet size must be 22” x 34” with SDOT border.

3. Graphical Scale

The minimum scale allowed for base maps is 1” = 10’. All base map plans must include a bar scale.

4. Lettering

All lettering for base maps shall be 0.08” or greater.

6. North Arrow

Compass Orientation: the north arrow shall be oriented with plan north to the left or top of the sheet. Range of 270-360°.

5. Utilities

Detailed information on all existing utilities that will be impacted by construction must be shown on the base map. The type, size, horizontal location and elevation of buried utilities and above ground infrastructure and utilities must be included within the area that will be impacted by construction. In addition to providing detailed information on the base map a list of the sources of the information must be provided. The list shall include the specific source of information such as side sewer cards, franchise and utility maps, vault plans, etc, and plan number for all under and/or aboveground utility information. Utility information obtained from an underground locator, via potholing etc. should be noted as such.

Sources for Survey and Base Map Information

The following are some resources for documentation and other useful information.

The standard plan symbols can be found in the Standard Plans for Municipal Construction Standard Plans 003a – 003o.

a. See Standard Plan 003a for electrical items such as signal controller cabinets, vaults, cables, conduits, ducts, and span wire.

b. See Standard Plan 003b for electrical items such as light poles, strain poles, luminaries, anchors, and grounds.

c. See Standard Plan 003c for electrical items such as traffic signals, mast arms, span wire, and detector loops.

d. See Standard Plan 003d for electrical items such as signal pedestals, vehicle signals, pedestrian signals, pedestrian push buttons, junction boxes, and hand holes.

e. See Standard Plan 003e for standard symbols for signalization, channelization, and signage.

f. See Standard Plan 003f for paving items such as concrete, asphalt, curb, sidewalks, driveways, and bike paths.

g. See Standard Plan 003g for sewer and drainage structures such as manholes, inlets, catch basins, and sand boxes.

h. See Standard Plan 003h for sewer and drainage lines such as culverts, combined pipes, sewer pipes, storm pipes, service drains, inlet and catch basin connections, ditches, and streams.

i. See Standard Plan 003i for topographic items such as bench marks, caps, hubs, monuments, tacks, and survey points.

j. See Standard Plan 003j for topographic items such as centerlines, monument lines, survey lines, right of way lines, easement lines, building lines, fences, guardrails, rock facings, rip rap, and trees.

k. See Standard Plan 003k for topographic items such as bushes, grade lines, slope lines, contours, vertical curves, depressions, dimension lines, and match lines.

l. See Standard Plan 003l for topographic items such as monitoring wells, street name signs, mail boxes, posts, parking meters, castings, jersey barriers, tree pits, and north arrow.

m. See Standard Plan 003m for private utilities such as telephone, television, steam, and gas.

n. See Standard Plan 003n for water items such as water mains, blocking, bends, crosses, tees, pipe sleeves, hydrants, water meters, and valves.

o. See Standard Plan 003o for water items such as valves, blowoffs, and water chambers.

CADD files of all the standard symbols can be found at http://www.seattle.gov/util/Engineering/CAD_Resources/GeneralCADDSupport/COS_001776.asp

Seattle Public Utilities (SPU) Engineering

Engineering, design and survey resources for developers, contractors, engineers and consultants

http://www.seattle.gov/util/Engineering/index.asp

Department of Planning and Development (DPD)

Client Assistance Memos (CAMs)

http://www.seattle.gov/dpd/Publications/Client_Assistance_Memos_(CAMs)/default.asp

Side Sewer Cards and Maps

http://web1.seattle.gov/dpd/sidesewercardsv2/

DPD GIS

http://web1.seattle.gov/dpd/dpdgisv2/mapviewer.aspx

The DPD Permit Counter located on the 20TH Floor of the Seattle Municipal Tower has information available on Sanitary Side Sewers and Service Drain lines.

Washington Council of County Surveyors

The Washington Council of County Surveyors contains survey control data posted on a map server. Other tools, links, and useful information can also be found on their website.

http://www.wa-ccs.org/

Washington State Reference Network

The GPS Network is a cooperative network delivering survey data and real-time GPS corrections for the Puget Sound region. For additional information visit the Puget Reference Station Network website.http://www.prsn.org/

Monument Reference Sites

http://plso.wadnr.gov/wccsmap

http://www.wsdot.wa.gov/Monument/gis/viewer.htm

Seattle Public Utilities (SPU) Engineering Records Vault

Resources available in the Engineering Records Vault on the 47th floor of the Seattle Municipal Tower, 700 – 5th Avenue, include:

Maps

- Engineering quarter section maps, new (GIS computer-generated) and old (mylar).
- Aerial topography maps, new and old.
- Sewage and drainage topography maps.
- Base maps.
- Various City maps, including the 1:400 scale maps and the Vault Plan Index (VPI) original mylars.

Publications

- City of Seattle Standard Specifications, current and previous editions.
- City of Seattle Standard Plans, current and previous editions.
- Geotechnical soil boring, piling and slide reports on microfilm.
- Henry Fitch / Works Progress Administration (WPA) drainage and landslide reports and associated fieldbooks.
- Published City of Seattle ordinances (Also found at the City Clerk's Office).

Indexes

- Aerial photograph indexes.
- Base map indexes, geographic and card file.
- Capital Improvement Plan and Street Improvement Permitting (SIP) construction plans Inspector's (Resident Engineer) notes and reports notebooks.
- Geotechnical soil boring, piling and slide reports indexes on the VPI miscellaneous pages.
- King County plat books and condominium plat indexes, computer print out (showing the unrecorded plats) and card file.
- Offsite records storage notebook.
- Pre-1968 Capital Improvement Plan Construction plan card file.
- SDOT Roadway Structures listing for bridges, retaining walls and stairways.
- Survey field book index card files.
- Vault Plan Index (VPI), electronic and manual (Plan Register book and the ledger books).
- Water books, including two computer printout indexes listing projects outside the City of Seattle limits or projects not found in the VPI.

Plans

- Capital Improvement Plan construction plans.
- Street Improvement Permitting (SIP) construction plans.
- METRO, King County, or State of Washington plans that impact City of Seattle public rights of way.
- Inspector's (Resident Engineer) books.

- Plans for projects outside City of Seattle limits.

Survey Information

- Fieldbooks.
- Full section and 1/16th maps.
- Quarter section calculation sheets.
- Right of way and section files.
- King County plat books.
- Various shoreland and tideland maps.

Seattle Public Utilities (SPU) Survey Office

Resources available in the Survey Office on the 47th floor of the Seattle Municipal Tower, 700 – 5th Avenue, include:

- Large Plat Maps
- Computation files by street name, area, structure, or plat
- Large Scale Profiles (approx. 1950-1998) by street name
- Water Dept Field Book Index
- Pipeline ROW maps
- Records for: Cedar River Watershed, Tolt River Watershed, Lake Youngs, Eastside Supply Line, and Mercer Island Supply Line
- City Light Field Book Index
- City Light Calculation records by Sec, Twp, Rge
- Power Lines from Skagit to Seattle
- Franchise Utility Records such as telephone, cable TV, steam, natural gas, and other private utilities
- Database for field books

For information on location and hours visit http://www.seattle.gov/util/Engineering/Records_Vault/Hours_&_Location/COS_001833.asp

SPU Base Map Manual

SPU has a base map manual available to the public. Go to http://www.seattle.gov/util/Engineering/Consulting_Resources/For_Drafting_Consultants/index.asp to view the Base Map Manual.

King County Metro

For standards on Metro Transit trolleys and passenger facilities go to http://your.kingcounty.gov/kcdot/transit/dcs/standards/

Traffic Signal Records

Signal operations records are located on the 37TH floor of the Seattle Municipal Tower. Call 206-684-5118 to make an appointment for research access to the records. A one business day notice is appreciated but it is not mandatory. Bring your own paper for copies you may need. Paper sizes are 81/2" x 11", 81/2" x14" and 11"x17" for the available copier.